

GROUNDWATER MONITORING STUDY

**14-60 CHARLOTTE STREET
ROCHESTER, NEW YORK**

Prepared for:	The City of Rochester 30 Church Street Rochester, New York 14614
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Project No.:	3240S-03
Date:	July 2003

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	FIELDWORK AND ANALYTICAL LABORATORY TESTING	2
2.1	Groundwater Evaluation.....	2
2.2	Analytical Laboratory Testing.....	2
3.0	FINDINGS	4
3.1	Potentiometric Map	4
3.2	Analytical Laboratory Test Results.....	4
3.3	Comparison of Selected Cumulative Groundwater Test Results	5
4.0	CONCLUSIONS	7

APPENDICES

Appendix A: Figures

Figure 1 - Project Locus Map

Figure 2 - Groundwater Potentiometric Contour Map for May 27, 2003

Appendix B: Monitoring Well Sampling Logs

Appendix C: Tables & Cumulative Data Graphs

Table 1 - Groundwater Analytical Laboratory Testing Program

Table 2 - Total Petroleum Hydrocarbons (TPH)

Table 3 - pH Analysis

Table 4 - Summary of Detected Volatile Organic Compounds (VOCs)

Table 5 - Groundwater Elevation Data for May 27,2003

Table 6 - Cumulative Groundwater Test Results

Appendix D: Analytical Laboratory Data

1.0 INTRODUCTION

Day Environmental, Inc. (DAY) completed this Groundwater Monitoring Study at 14-60 Charlotte Street, City of Rochester, County of Monroe, New York (Site). Studies were also performed on portions of the adjoining right-of-ways of Charlotte Street and Haags Alley. The location of the Site is shown on Figure 1 (Project Locus Map, included in Appendix A).

The City of Rochester is the current owner of the Site, which is vacant land. Proposed construction plans are currently not available; however, it is anticipated that redevelopment of the Site may consist of construction of a residential complex.

The City of Rochester authorized DAY to complete this round of groundwater monitoring and sampling to evaluate groundwater quality trends in Haags Alley, located immediately north of the 14-60 Charlotte Street Site, and on the northwestern portion of the Site near Haags Alley. The City of Rochester previously installed two monitoring wells in Haags Alley south of a former off-site dry cleaning facility (MW-12), and south of a former auto repair and a former auto painting facility (MW-13) to evaluate the potential that these off-site properties may be possible sources of a petroleum-based groundwater plume that has impacted the Site. Previous groundwater sampling has confirmed elevated concentrations of contaminants in off-site wells MW-12 and MW-13. Well MW-1 located on the northwest portion of the Site was also used during this sampling event and groundwater at this location has historically contained low concentrations the chlorinated VOC tetrachloroethene.

This report summarizes the various groundwater monitoring studies conducted on May 27, 2003 in order to further evaluate groundwater quality at the Site.

2.0 FIELDWORK AND ANALYTICAL TESTING

This section describes the fieldwork and analytical laboratory testing conducted as part of this study.

2.1 Groundwater Evaluation

On May 27, 2003, a Heron oil/water interface meter (Model HO1.L) was used to measure static water levels (SWLs) in the six existing wells (MW-1, MW-4, MW-5, MW-12, MW-13 and MW-14). The static water level data was used to calculate groundwater elevations for each well, and subsequently develop a potentiometric groundwater contour map. In addition, the Heron oil/water interface meter was used at the six well locations to measure for the presence of light non-aqueous phase liquid (LNAPL). Also, headspace readings for volatile organic compounds (VOCs) were collected from the ambient air inside each well when first opened by using a MiniRae 2000 Photoionization detector (PID) equipped with a 10.6 eV lamp.

On May 27, 2003, three of the six wells (MW-1, MW-12 and MW-13) were purged by removing approximately three well casing volumes of groundwater, and a groundwater sample was subsequently collected from each well using a 3 foot disposable bailer for each and submitted for laboratory analysis (designated as samples 3240-01 [MW-1], 3240-02 [MW-12] and 3240-03 [MW-13]). Pertinent information for each well, including temperature, pH, conductivity, turbidity and oxidation reduction potential was recorded on monitoring well sampling logs, which are included in Appendix B.

2.2 Analytical Laboratory Testing

Groundwater samples were submitted under chain-of-custody control to Paradigm Environmental Services, Inc. (Paradigm), which is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified analytical laboratory. The three samples (i.e., 3240-01 [MW-1], 3240-02 [MW-12] and 3240-03 [MW-13]) were analyzed for the following parameters:

- United States Environmental Protection Agency (USEPA) Target Compound List (TCL) and New York State Department of Environmental Conservation (NYSDEC) Spill Technology and Remediation Series (STARS)-list Volatile Organic Compounds (VOCs) using USEPA Method 8260;
- Total Petroleum Hydrocarbons (TPH) using NYSDOH Method 310.13 and;
- pH using USEPA Method 9040.

This analytical laboratory program is summarized on Table 1 included in Appendix C. A copy of the report submitted by Paradigm for the above samples and executed chain-of-custody documentation are included in Appendix D. The Monitoring Well Sampling Logs included in Appendix B indicate the following field evidence of contamination:

- A slight sheen and solvent odor were noted on purge water removed from well MW-1 during the sampling event;
- a peak PID reading of 14.8 parts per million (ppm) was measured on the ambient air inside well MW-12, and a very thin layer of petroleum and petroleum-type odors were noted on purge water removed from this well during the sampling event, and;
- a peak PID reading of 15.9 ppm was measured on the ambient air inside well MW-13, and a slight sheen and petroleum-type odors were noted on purge water removed from this well during the sampling event.

3.0 FINDINGS

The findings of this Groundwater Monitoring Study are summarized in this section and include a discussion on the development and interpretation of a potentiometric map, and the analytical laboratory test results compared to available regulatory and exposure assessment criteria.

3.1 Potentiometric Map

Well elevations were previously surveyed in relation to an assumed datum of 100.00 feet. The well elevations, static water levels, and calculated groundwater elevations measured on May 27, 2003 are presented on Table 5 included in Appendix C. The measured depths to groundwater ranged between 6.61 feet and 7.90 feet below the ground surface (i.e., below the top of the protective curb box at each well location). A copy of the potentiometric map (Figure 2) is included in Appendix A.

Calculated groundwater elevations were generally highest on the western portion of the Site, and lowest on the eastern portion of the Site. As shown, groundwater for May 27, 2003 appears to generally flow toward the east. The hydraulic gradient across the Site varies between approximately 0.02 ft/ft (northwest portion of Site) and 0.01 ft/ft (southwest portion and eastern half of Site).

3.2 Analytical Laboratory Test Results

Copies of analytical laboratory test results for groundwater samples are included in Appendix D. Tables 1 through 4 (included in Appendix C) summarize the test results for each analyzed parameter. The tables also include a comparison of the test results to the following criteria:

- Available groundwater standards and guidance values as referenced in the NYSDEC Technical and Operational Guidance Series 1.1.1 document titled “Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations” (TOGS 1.1.1) dated June 1998.
- Available Site-Specific Target Levels (SSTLs) for residential receptor – groundwater volatilization to indoor air exposure pathway as presented in an Exposure Assessment for the Site dated June 2001 that was prepared by DAY using the RBCA Tool Kit for Chemical Releases (version 1.3). As long as the groundwater is not being used as a potable source of drinking water, this exposure pathway exhibits the most stringent set of calculated SSTLs.
- Available Contaminant Concentration Limits (CCLs) for adult residential receptor – groundwater volatilization to indoor air exposure pathway as presented in the NYSDEC document titled “Guidelines for Petroleum Spill Site Inactivation” dated February 23, 1998. As long as the groundwater is not being used as a potable source of drinking water, this exposure pathway exhibits the most stringent set of calculated CCLs.

The data and its comparison to the above criteria are summarized below:

- As shown on Table 2, medium-weight TPH identified as diesel fuel was detected in groundwater samples from wells MW-12 and MW-13 at concentrations of 74,300 ug/L or ppb and 655 ug/L or ppb, respectively. In addition, light-weight TPH identified as gasoline was detected in MW-13 at a concentration of 1,290 ug/L or ppb. TPH was not detected at concentrations above reported detection limits in the sample from MW-1. There are no NYSDEC cleanup criteria for TPH in groundwater. However, the concentration of medium-weight TPH detected in MW-12, and light-weight TPH detected in MW-13, exceeded their respective residential receptor SSTLs as referenced above.

- As shown on Table 3, pH values for wells MW-1, MW-12 and MW-13 were measured at 7.09, 6.72, and 6.98, respectively.
- TCL and STARS-list VOCs were detected above analytical laboratory detection limits in the three groundwater samples tested. The VOCs detected in groundwater samples MW-12 and MW-13 are typically associated with petroleum and/or hydrocarbon-based products (i.e., VOCs such as benzene, ethylbenzene, trimethylbenzenes, etc.). A chlorinated VOC typically associated with dry cleaning operations (e.g., tetrachloroethene) was detected in the groundwater sample collected from MW-1. Total VOC concentrations detected in the groundwater samples ranged between 14.8 ug/L or ppb (MW-1) and 502.03 ug/L or ppb (MW-13). The concentrations of one or more VOCs detected in each of the groundwater samples exceeded their respective groundwater standards or guidance values as referenced in TOGS 1.1.1. However, the concentrations of VOCs detected in each of the groundwater samples did not exceed their respective SSTLs or CCLs as referenced above.

3.2 Comparison of Selected Cumulative Groundwater Test Results

Cumulative analytical laboratory test results for groundwater samples collected from monitoring wells MW-1, MW-12 and MW-13 in May 2000, August 2000, December 2000 or May 2003 were compared to evaluate potential trends in contaminants present in groundwater within, or near, the right-of-way of Haags Alley. Table 6 included in Appendix C compares the types and concentrations of TPH and total VOCs detected in groundwater samples that were collected from MW-1, MW-12 and MW-13. Also included in Appendix C is graphed data for cumulative TPH and total VOC data on a per-well basis for MW-1, MW-12 and/or MW-13.

Some potential trends in data over time for these wells are provided below; however, seasonal variations, laboratory subjectivity regarding TPH identities, and the limited amount of data being compared need to be considered when interpreting this data. The cumulative data are further discussed as follows:

MW-1

- TPH was not detected in samples from well MW-1.
- The type and concentration of VOC detected in samples from well MW-1 remained similar over time (i.e., tetrachloroethene detected at concentrations of 17 ug/l, 15.6 ug/l and 14.8 ug/l detected between May 2000 and May 2003).

MW-12

- TPH detected in samples from well MW-12 increased significantly over time (i.e., 490 ug/l in August 2000 and 74,000 ug/l in May 2003). TPH detected in the August 2000 groundwater sample from well MW-12 was identified as light-weight gasoline. The TPH detected in the May 2003 groundwater sample from well MW-12 was identified as medium-weight diesel fuel.
- The type and concentrations of VOCs detected in samples from well MW-12 remained relatively constant with some variation (e.g., 268.39 ug/l, 129 ug/l and 246.33 ug/l total VOCs between August 2000 and May 2003).

MW-13

- TPH detected in samples from well MW-13 decreased slightly over time (i.e., 2,040 ug/l in December 2000 and 1,945 ug/l in May 2003). TPH detected in the December 2000 groundwater sample from well MW-13 was identified as light-weight gasoline. The TPH detected in the May 2003 groundwater sample from well MW-13 was identified as a mixture of light-weight gasoline and medium-weight diesel fuel.
- Total VOCs decreased in MW-13 over time (i.e., 743.7 ug/l in December 2000 and 502.03ug/l in May 2003).

4.0 CONCLUSIONS

VOCs are present in the groundwater in wells MW-1, MW-12 and MW-13 at concentrations that exceed groundwater standards and guidance values as established in NYSDEC TOGS 1.1.1. However, the concentrations of VOCs detected in these samples do not exceed residential receptor SSTLs or adult residential receptor CCLs for the groundwater volatilization to indoor air exposure pathway. Potential presence of LNAPL (slight sheen and thin layer of petroleum) was detected in three of the six wells (i.e., MW-1, MW-12 and MW-13) that were monitored as part of this study.

Based upon the testing completed on groundwater samples collected from the Site on May 27, 2003, the groundwater is contaminated with light weight TPH (identified as gasoline) and/or medium weight TPH (identified as diesel fuel). There is no NYSDEC groundwater standard or guidance value for TPH; however, the concentrations of medium-weight TPH or light-weight TPH detected in May 2003 groundwater samples from well MW-12 and well MW-13 exceed the residential receptor SSTL for the groundwater volatilization to indoor air exposure pathway.

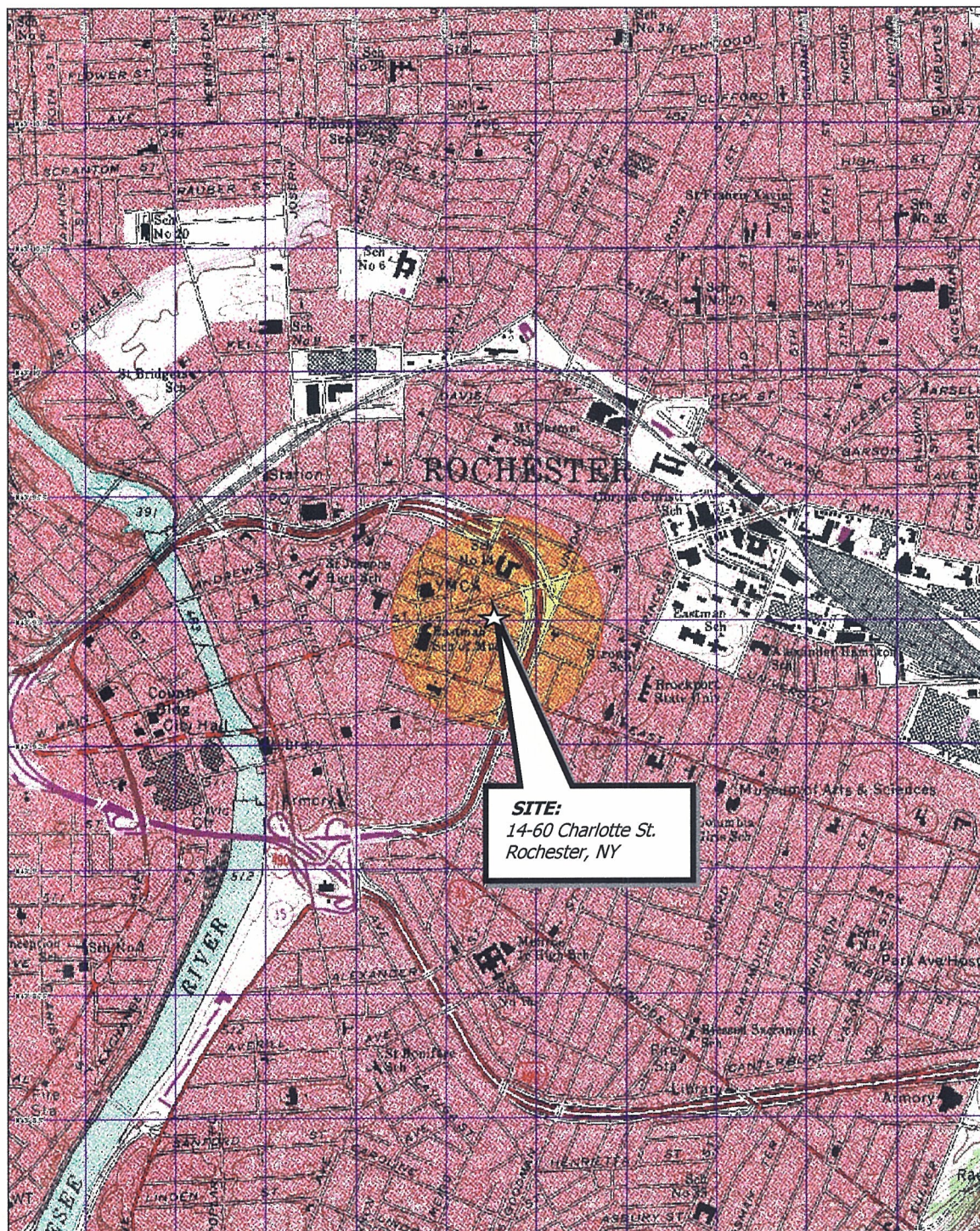
A review of the cumulative groundwater analytical data from wells MW-1, MW-12 and MW-13 suggests that the types of VOCs detected over time at each well remains similar with some fluctuating increases or decreases in total concentrations. The cumulative TPH data suggests a potential source of medium-weight diesel fuel near Haags Alley and closest to MW-12 that was not detected in earlier samples. Further groundwater analytical laboratory testing and other investigation would need to be conducted to confirm this trend.

The highest concentration of VOCs and TPH were detected in wells MW-12 and MW-13 located off-site in Haags Alley, indicating a potential off-site source(s) of groundwater contamination. The measured depths to groundwater ranged between 6.61 feet and 7.90 feet below the ground surface, and groundwater elevations were generally highest on the western portion of the Site, and lowest on the eastern portion of the Site. Groundwater for the May 27, 2003 monitoring event appears to generally flow toward the east. Previous subsurface studies have documented that a portion of the groundwater plume in Haags Alley appears to have migrated onto and impacted the 14-60 Charlotte Street Site. Since the potential sources of off-site groundwater contamination have not been identified or mitigated, it is anticipated that the groundwater plume in Haags Alley will continue to migrate and impact the Charlotte Street Site.

Exceedances in the SSTLs suggest environmental engineering controls (EECs) may need to be designed and installed at the Site if residential redevelopment is planned. In addition, implementation of the existing environmental management plan (EMP) and health and safety plan (HASP) continues to be warranted to address proper characterization, handling, disposal and exposure control associated with this contamination. The extent and type of EECs would be dependent upon the construction details and specifications of future structures. EECs may not be warranted if the probable off-site source(s) of contaminants near Haags Alley (e.g., TPH, etc.) is adequately addressed (i.e., remediated). Future redevelopment could also proceed with a combination of remediation of contamination and design and implementation of EECs.

APPENDIX A

Figures



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 550 ft Scale: 1 : 19,200 Detail: 14-0 Datum: WGS84

Drawing Produced From: 3-D TopoQuads, DeLorme Map Co., referencing USGS quad map Rochester East (NY) 1995 and Rochester West (NY) 1995. Site Lat/Long: N43°9.50'– W77°35.90'

DATE
06-13-2003

DRAWN BY
LRP

SCALE
1" = 2000'



DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14614-1008

PROJECT TITLE
14-60 CHARLOTTE STREET
ROCHESTER, NY

GROUNDWATER MONITORING STUDY

DRAWING TITLE
PROJECT LOCUS MAP

PROJECT NO.
3240S-03

FIGURE 1

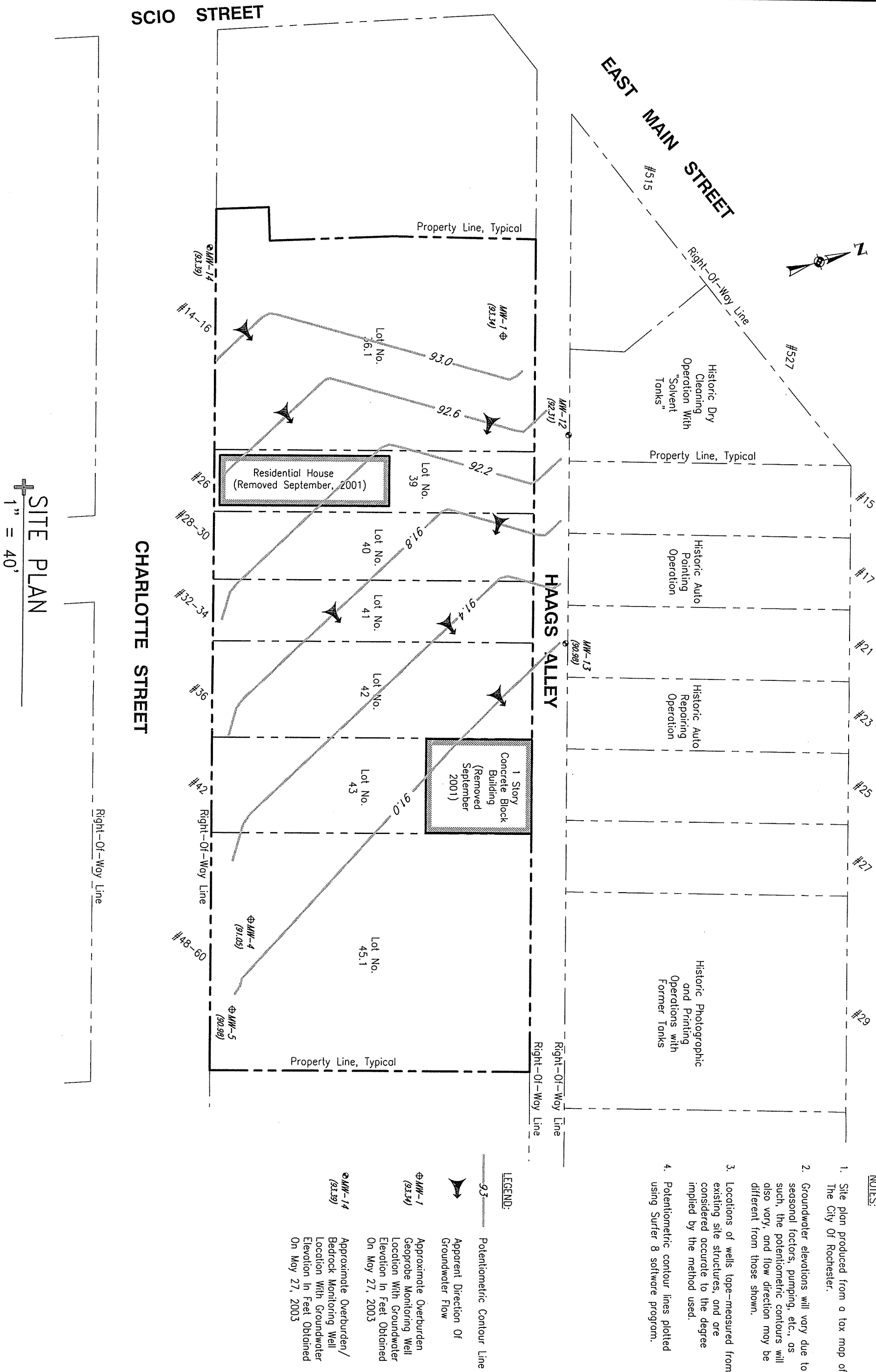


FIGURE 2

PROJECT NO.
3240S-03

PROJECT TITLE
14-60 CHARLOTTE STREET
ROCHESTER, NEW YORK

GROUNDWATER MONITORING STUDY

DRAWING TITLE

Groundwater Potentiometric Contour Map For May 27, 2003

day

DAY ENVIRONMENTAL, INC.
ENVIRONMENTAL CONSULTANTS
ROCHESTER, NEW YORK 14614-1008

Design/Tag	DATE
CCD	06-23-2003
DRAWN BY	DATE DRAWN
LRP	06-23-2003
SCALE	DATE ISSUED
1"= 40'	06-23-2003

APPENDIX B

Monitoring Well Sampling Logs

**DAY ENVIRONMENTAL, INC.
MONITORING WELL SAMPLING LOG**

WELL MW-1

SECTION 1 - SITE INFORMATION

SITE LOCATION: 14-60 Charlotte Street & Hags Alley, Rochester, New York **JOB #:** 3240S-03 .

PROJECT NAME: Groundwater Monitoring Study **DATE :** 05/27/03 .

SAMPLE COLLECTOR(S): C. Davidson .

WEATHER CONDITIONS: Sunny ~65°F **PID IN WELL (PPM):** 0.0 .

SECTION 2 - PURGE INFORMATION

DEPTH OF WELL [FT]: 9.21 (MEASURED FROM TOP OF CASING - T.O.C.)

STATIC WATER LEVEL (SWL) [FT]: 7.31 (MEASURED FROM T.O.C.)

THICKNESS OF WATER COLUMN [FT]: 1.90 (DEPTH OF WELL - SWL)

CALCULATED VOL. OF H₂O PER WELL CASING [GAL]: 0.07 **CASING DIA.:** 1" .

CALCULATIONS:

<u>CASING DIA. (FT)</u>	<u>WELL CONSTANT(GAL/FT)</u>	<u>CALCULATIONS</u>
¾" (0.0625)	0.023	VOL. OF H ₂ O IN CASING = DEPTH OF WATER COLUMN X WELL CONSTANT
1" (0.0833)	0.041	
1¼" (0.1041)	0.063	
2" (0.1667)	0.1632	
3" (0.250)	0.380	
4" (0.3333)	0.6528	
4½" (0.375)	0.826	
6" (0.5000)	1.4688	
8" (0.666)	2.611	

CALCULATED PURGE VOLUME [GAL]: 0.23 (3 TIMES CASING VOLUME)

ACTUAL VOLUME PURGED [GAL]: ~0.25 .

PURGE METHOD: 3' disposable bailer **PURGE START:** 1305 **END:** 1515 .

SECTION 3 - SAMPLE IDENTIFICATION AND TEST PARAMETERS

SAMPLE ID #	DATE / TIME	SAMPLING METHOD	ANALYTICAL SCAN(S)
MW-1	5/27/03 15:00	3' disposable bailer	TPH 310.13; pH and 8260 TCL + STARS

SECTION 4 - WATER QUALITY DATA

SWL (FT)	TEMP (°C)	pH	CONDUCTIVITY (µS/cm)	TURBIDITY (NTU)	ORP (mV)	VISUAL
7.31	15.2	NC	3.35	>990	336	Light Brown, Murky Slight Sheen, Solvent odor

NC = Not Collected

**DAY ENVIRONMENTAL, INC.
MONITORING WELL SAMPLING LOG**

WELL MW-12

SECTION 1 - SITE INFORMATION

SITE LOCATION: 14-60 Charlotte Street & Hags Alley, Rochester, New York **JOB #:** 3240S-03 .

PROJECT NAME: Groundwater Monitoring Study **DATE :** 05/27/03 .

SAMPLE COLLECTOR(S): C. Davidson .

WEATHER CONDITIONS: Cloudy ~60°F **PID IN WELL (PPM):** 14.8 .

SECTION 2 - PURGE INFORMATION

DEPTH OF WELL [FT]: 12.05 (MEASURED FROM TOP OF CASING - T.O.C.)

STATIC WATER LEVEL (SWL) [FT]: 7.01 (MEASURED FROM T.O.C.)

THICKNESS OF WATER COLUMN [FT]: 5.04 (DEPTH OF WELL - SWL)

CALCULATED VOL. OF H₂O PER WELL CASING [GAL]: 0.8 **CASING DIA.:** 2" .

CALCULATIONS:

<u>CASING DIA. (FT)</u>	<u>WELL CONSTANT(GAL/FT)</u>	<u>CALCULATIONS</u>
¾" (0.0625)	0.023	VOL. OF H ₂ O IN CASING = DEPTH OF WATER COLUMN X WELL CONSTANT
1" (0.0833)	0.041	
1¼" (0.1041)	0.063	
2" (0.1667)	0.1632	
3" (0.250)	0.380	
4" (0.3333)	0.6528	
4½" (0.375)	0.826	
6" (0.5000)	1.4688	
8" (0.666)	2.611	

CALCULATED PURGE VOLUME [GAL]: 2.5 (3 TIMES CASING VOLUME)

ACTUAL VOLUME PURGED [GAL]: ~2.5 .

PURGE METHOD: 3' disposable bailer **PURGE START:** 1335 **END:** 1343 .

SECTION 3 - SAMPLE IDENTIFICATION AND TEST PARAMETERS

SAMPLE ID #	DATE / TIME	SAMPLING METHOD	ANALYTICAL SCAN(S)
MW-12	5/27/03 13:50	3' disposable bailer	TPH 310.13; pH and 8260 TCL + STARS

SECTION 4 - WATER QUALITY DATA

SWL (FT)	TEMP (°C)	pH	CONDUCTIVITY (µS/cm)	TURBIDITY (NTU)	ORP (mV)	VISUAL
7.01	14.8	NC	1.49	>990	-64	Brown to Green Murky. Strong petroleum odor, very thin layer of petroleum on water (dark brown in color)

NC = Not Collected

**DAY ENVIRONMENTAL, INC.
MONITORING WELL SAMPLING LOG**

WELL MW-13

SECTION 1 - SITE INFORMATION

SITE LOCATION: 14-60 Charlotte Street & Haggs Alley, Rochester, New York **JOB #:** 3240S-03 .

PROJECT NAME: Groundwater Monitoring Study **DATE :** 05/27/03 .

SAMPLE COLLECTOR(S): C. Davidson .

WEATHER CONDITIONS: Cloudy ~60°F **PID IN WELL (PPM):** 15.9 .

SECTION 2 - PURGE INFORMATION

DEPTH OF WELL [FT]: 14.46 (MEASURED FROM TOP OF CASING - T.O.C.)

STATIC WATER LEVEL (SWL) [FT]: 6.86 (MEASURED FROM T.O.C.)

THICKNESS OF WATER COLUMN [FT]: 7.60 (DEPTH OF WELL - SWL)

CALCULATED VOL. OF H₂O PER WELL CASING [GAL]: 1.2 **CASING DIA.:** 2" .

CALCULATIONS:

CASING DIA. (FT)

WELL CONSTANT(GAL/FT)

CALCULATIONS

¾" (0.0625)	0.023
1" (0.0833)	0.041
1¼" (0.1041)	0.063
2" (0.1667)	0.1632
3" (0.250)	0.380
4" (0.3333)	0.6528
4½" (0.375)	0.826
6" (0.5000)	1.4688
8" (0.666)	2.611

VOL. OF H₂O IN CASING = DEPTH OF WATER COLUMN X WELL CONSTANT

CALCULATED PURGE VOLUME [GAL]: 3.6 (3 TIMES CASING VOLUME)

ACTUAL VOLUME PURGED [GAL]: ~3.6 .

PURGE METHOD: 3' disposable bailer **PURGE START:** 1416 **END:** 1430 .

SECTION 3 - SAMPLE IDENTIFICATION AND TEST PARAMETERS

SAMPLE ID #	DATE / TIME	SAMPLING METHOD	ANALYTICAL SCAN(S)
MW-13	5/27/03 14:30	3' disposable bailer	TPH 310.13; pH and 8260 TCL + STARS

SECTION 4 - WATER QUALITY DATA

SWL (FT)	TEMP (°C)	pH	CONDUCTIVITY (µS/cm)	TURBIDITY (NTU)	ORP (mV)	VISUAL
6.86	15.2	NC	1.89	570	-70	Clear, Petroleum odor, Slight Sheen

NC = Not Collected

APPENDIX C

Tables & Cumulative Data Graphs

TABLE 1

**14-60 CHARLOTTE STREET
ROCHESTER, NEW YORK**

GROUNDWATER ANALYTICAL LABORATORY TESTING PROGRAM

Well Location	Sample Date	Sample Number	Analysis
MW-1	05/27/03	3240-01	8260 / 310.13 / pH
MW-12	05/27/03	3240-02	8260 / 310.13 / pH
MW-13	05/27/03	3240-03	8260 / 310.13 / pH

USEPA Method 8260 used to test for TCL and STARS-list volatile organic compounds.
 NYSDOH Method 310.13 used to test for total petroleum hydrocarbons (TPH).

TABLE 2

14-60 CHARLOTTE STREET
ROCHESTER, NEW YORK

TOTAL PETROLEUM HYDROCARBONS (TPH)
IN UG/L OR PARTS PER BILLION (PPB)

MAY 27, 2003 GROUNDWATER SAMPLES

Sample Location	Sample Designation	TPH Test Results (PPB)	Residential Receptor SSTL for Groundwater Volatilization to Indoor Air (ppb) ⁽¹⁾
MW-1	3240-01	--	
MW-12	3240-02	74,300 - MW (diesel fuel)	22,000 (MW C10-C12 aromatic hydrocarbons)
MW-13	3240-03	1,290 - LW (gasoline); 655 - MW (diesel fuel)	310 (LW C8-C10 aliphatic hydrocarbons) 22,000 (MW C10-C12 aromatic hydrocarbons)

-- = Not detected above reported laboratory detection limit values.

LW = Light Weight

MW = Medium Weight

(1) = Most stringent calculated Site-Specific Target Level for TPH type referenced in June 2001 Exposure Assessment prepared by DAY.

TABLE 3

**14-60 CHARLOTTE STREET
ROCHESTER, NEW YORK**

pH ANALYSIS

MAY 27, 2003 GROUNDWATER SAMPLES

SAMPLE LOCATION	SAMPLE DESIGNATION	pH TEST RESULTS
MW-1	3240-01	7.09
MW-12	3240-02	6.72
MW-13	3240-03	6.98

TABLE 4

**14-60 CHARLOTTE STREET
ROCHESTER, NEW YORK**

**SUMMARY OF DETECTED
VOLATILE ORGANIC COMPOUNDS (VOCs)
IN UG/L OR PARTS PER BILLION (PPB)**

MAY 27, 2003 GROUNDWATER SAMPLES

DETECTED VOCs	3240-01/ MW-1	3240-02/ MW-12	3240-03/ MW-13	NYSDEC TOGS 1.1.1 GW Standards and Guidance Values (ppb) ⁽¹⁾	Residential Receptor SSTL for GW Vol. to IA - (ppb) ⁽²⁾	Adult Residential Receptor CCLs for GW Vol. to IA (ppb) ⁽³⁾
Benzene	--	8.24	3.84	1	24	49.6
Ethylbenzene	--	7.04	10.7	5	77,000	152,000
Total Xylenes	--	5.37	14.58	5	>200,000	55,000
Isopropylbenzene	--	10.6	58.6	5	NA	NA
n-Butylbenzene	--	--	14.0	5	NA	NA
n-Propylbenzene	--	17.2	99.0	5	NA	NA
1,2,4-Trimethylbenzene	--	42.7	266	5	NA	38,000
p-Isopropyltoluene	--	5.58	3.91	5	NA	NA
sec-Butylbenzene	--	17.3	28.3	5	NA	NA
Naphthalene	--	130	--	10	>31,000	7,420
Tetrachloroethene	14.8	--	--	5	160	NA
cis-1,2-Dichloroethene	--	2.30	3.10	5	NA	NA
Total VOCs	14.8	246.33	502.03	NA	NA	NA

-- = Not detected above reported laboratory detection limit value.

NA = Not available.

IA = Indoor Air

GW = Groundwater

Vol. = Volatilization

(1) = Groundwater Standards and Guidance Values referenced in June 1998 NYSDEC Division of Water TOGS (1.1.1) Ambient.

(2) = Site-Specific Target Levels referenced in June 2001 Exposure Assessment prepared by DAY.

(3) = Contaminant Concentration Limits referenced in NYSDEC document titled "Guidelines for Petroleum Spill Inactivation dated February 23, 1998.

TABLE 5

**14 – 60 CHARLOTTE STREET
ROCHESTER, NEW YORK**

GROUNDWATER ELEVATION DATA FOR MAY 27, 2003

WELL ID	CURB BOX ELEVATION (FT)	ELEVATION OF PVC WELL CASING (FT)	STATIC WATER LEVEL (SWL) MEASUREMENT (FT)	GROUNDWATER ELEVATION (FT)
MW-1	100.93	100.65	7.31	93.34
MW-4	97.66	97.36	6.31	91.05
MW-5	97.60	97.41	6.43	90.98
MW-12	99.67	99.32	7.01	92.31
MW-13	98.10	97.84	6.86	90.98
MW-14	101.29	101.00	7.61	93.39

NOTES: Elevations based on assumed Project Benchmark elevation of 100.00 feet

Free oil product was not detected in any of the wells during measurements taken on May 27, 2003 using an oil/water interface probe

TABLE 6

**14-60 CHARLOTTE STREET
ROCHESTER, NEW YORK**

**CUMULATIVE GROUNDWATER TEST RESULTS
IN UG/L OR PARTS PER BILLION (PPB)**

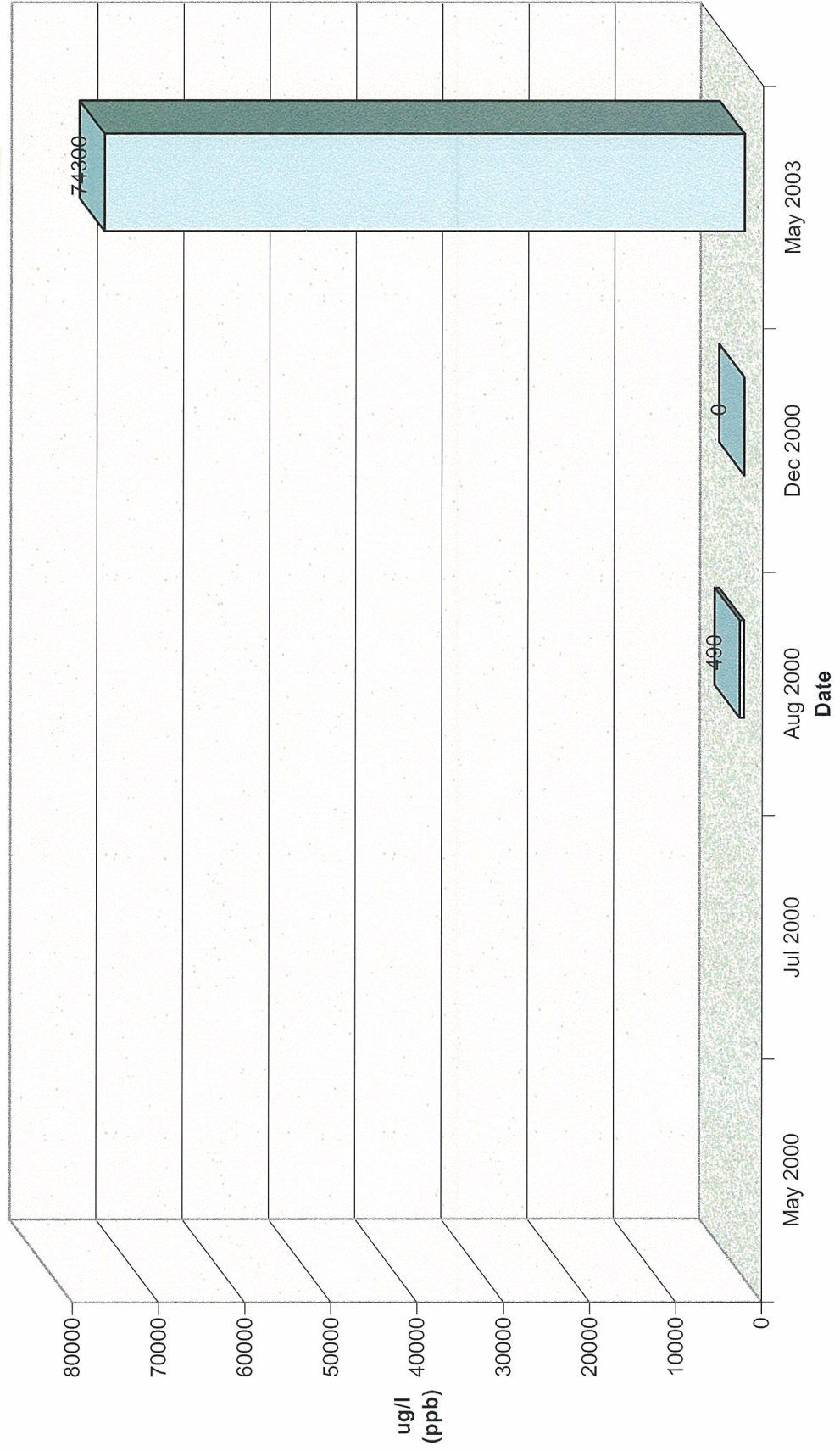
MONITORING WELLS MW-1, MW-12 & MW-13

Sample Location	TPH				Total VOCs			
	May 2000	August 2000	December 2000	May 2003	May 2000	August 2000	December 2000	May 2003
MW-1	--	NC	--	--	17	NC	15.6	14.8
MW-12	NC	490 LW (gasoline)	--	74300 MW (diesel fuel)	NC	268.39	129	246.33
MW-13	NC	NC	2040 LW (gasoline)	1290 LW (gasoline); 655 MW (diesel fuel)	NC	NC	743.7	502.03

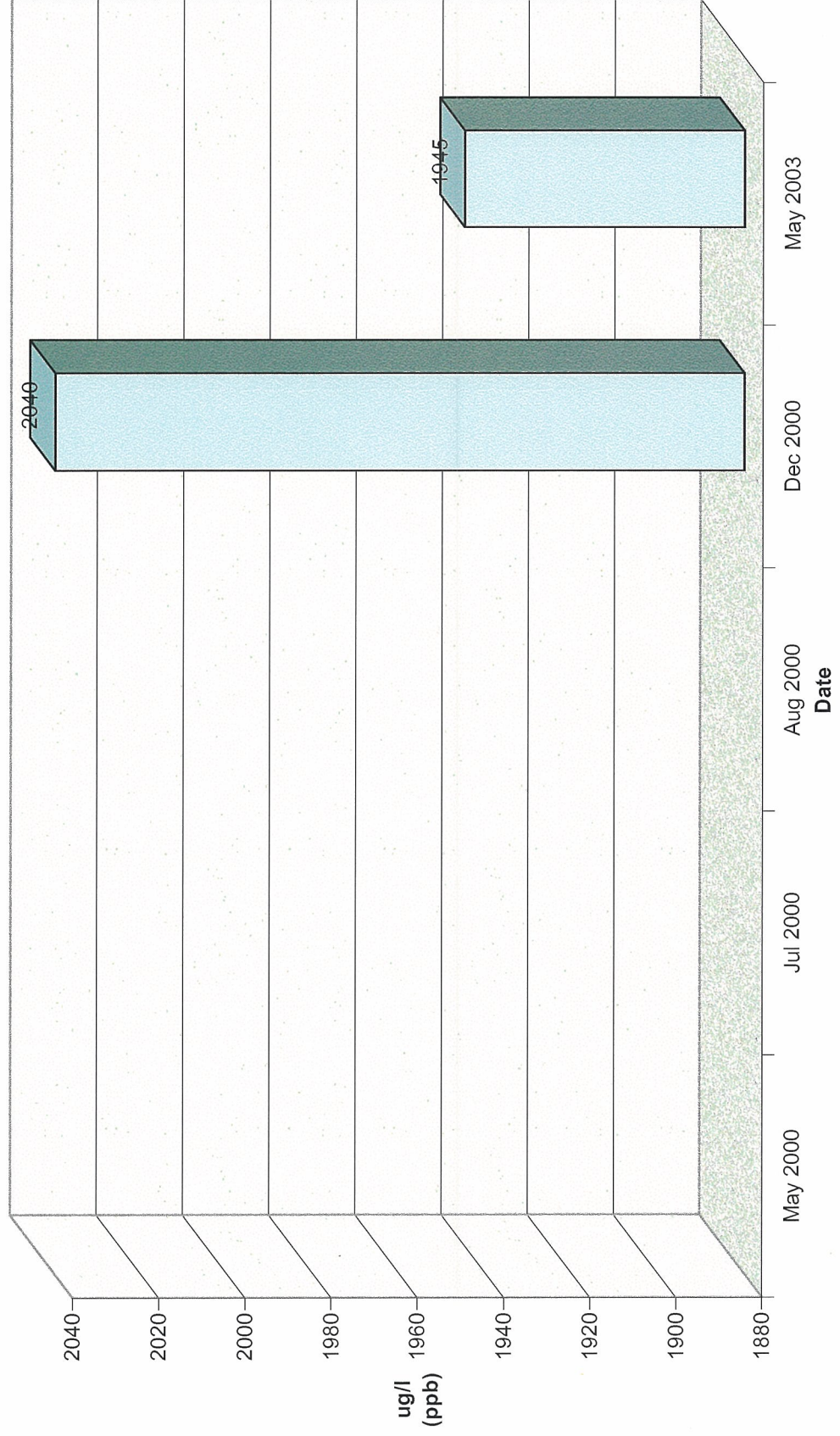
-- = Not detected above reported analytical laboratory detection limit values.
 LW = Light Weight
 MW = Medium Weight
 TPH = Total petroleum hydrocarbons
 VOCs = Volatile organic compounds
 NC = Not collected

There under
JD 4538.rev.

TPH
MW-12 - Haags Alley



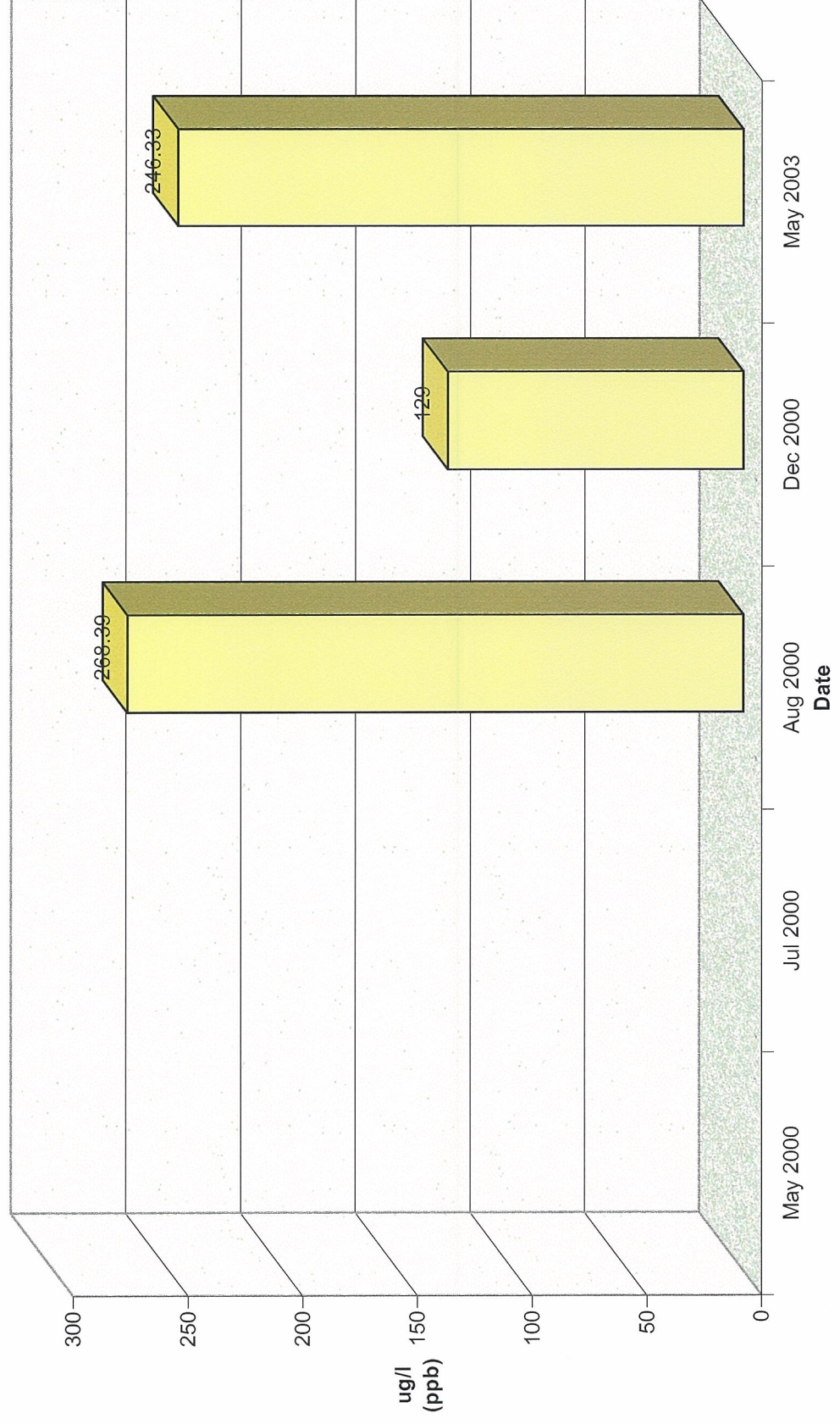
TPH
MW-13 - Haags Alley



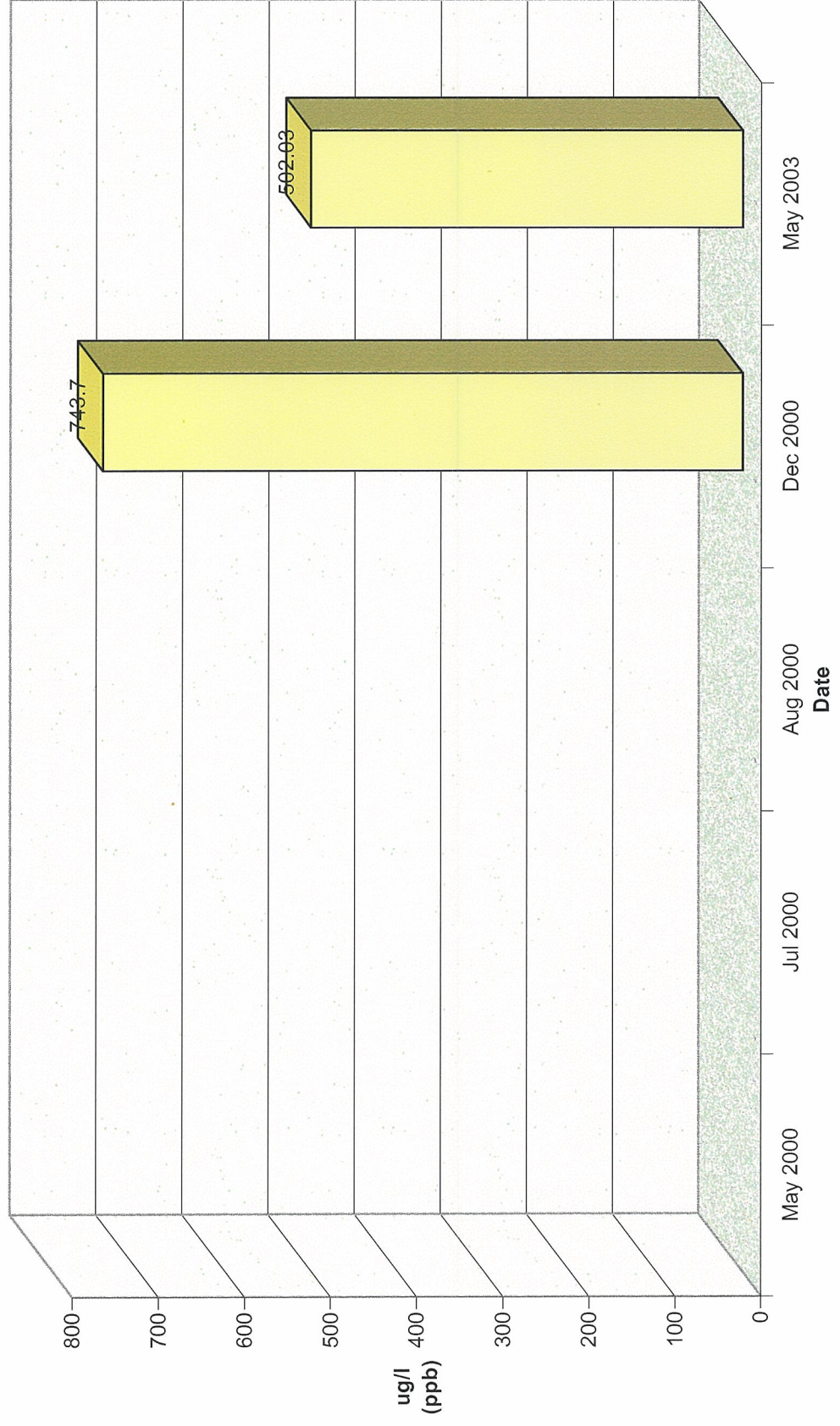
Total VOCs
MW-1 - 14-60 Charlotte St.



Total VOCs
MW-12 - Haags Alley



Total VOCs
MW-13 - Haags Alley



APPENDIX D

Analytical Laboratory Data

PHC Analysis Report for Non-potable Water

Client: Day Environmental Inc

Client Job Site: RoCity

Lab Project Number: 03-1393

Lab Sample Number: 5103

Client Job Number: 3240S-03

Field Location: MW-1

Date Sampled: 05/27/2003

Field ID Number: 3240-01

Date Received: 05/27/2003

Sample Type: Water

Date Analyzed: 05/29/2003


PHC Classification	Results in ug / L
Petroleum Hydrocarbon	ND< 250

ELAP Number 10958

Method: NYSDOH 310.13

Comments: ND denotes Non Detect
ug / L = microgram per Liter
PHC = Petroleum Hydrocarbon

Signature:


Bruce Hoogesteger: Technical Director

PHC Analysis Report for Non-potable Water

Client: Day Environmental Inc

Client Job Site: RoCity

Lab Project Number: 03-1393

Lab Sample Number: 5104

Client Job Number: 3240S-03

Field Location: MW-12

Date Sampled: 05/27/2003

Field ID Number: 3240-02

Date Received: 05/27/2003

Sample Type: Water

Date Analyzed: 05/29/2003


PHC Classification	Results in ug / L
Medium Weight PHC as: Diesel Fuel	74,300

ELAP Number 10958

Method: NYSDOH 310.13

Comments: ND denotes Non Detect
ug / L = microgram per Liter
PHC = Petroleum Hydrocarbon

Signature:


Bruce Hoogesteger, Technical Director

PHC Analysis Report for Non-potable Water

Client: Day Environmental Inc

Client Job Site: RoCity

Lab Project Number: 03-1393

Lab Sample Number: 5105

Client Job Number: 3240S-03

Field Location: MW-13

Date Sampled: 05/27/2003

Field ID Number: 3240-03

Date Received: 05/27/2003

Sample Type: Water

Date Analyzed: 05/29/2003

PHC Classification	Results in ug / L
Light Weight PHC as: Gasoline	1,290
Medium Weight PHC as: Diesel Fuel	655

ELAP Number 10958

Method: NYSDOH 310.13

Comments: ND denotes Non Detect
ug / L = microgram per Liter
PHC = Petroleum Hydrocarbon

Signature:


Bruce Hoogesteger: Technical Director

Volatile Analysis Report for Non-potable Water

Client: Day Environmental, Inc.

Client Job Site: RoCity
Client Job Number: 3240S-03
Field Location: MW-1
Field ID Number: 3240-01
Sample Type: Water

Lab Project Number: 03-1393
Lab Sample Number: 5103
Date Sampled: 05/27/2003
Date Received: 05/27/2003
Date Analyzed: 06/02/2003

Halocarbons	Results in ug / L
Bromodichloromethane	ND< 2.00
Bromomethane	ND< 2.00
Bromoform	ND< 2.00
Carbon tetrachloride	ND< 2.00
Chloroethane	ND< 2.00
Chloromethane	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00
Chloroform	ND< 2.00
Dibromochloromethane	ND< 2.00
1,1-Dichloroethane	ND< 2.00
1,2-Dichloroethane	ND< 2.00
1,1-Dichloroethene	ND< 2.00
cis-1,2-Dichloroethene	ND< 2.00
trans-1,2-Dichloroethene	ND< 2.00
1,2-Dichloropropane	ND< 2.00
cis-1,3-Dichloropropene	ND< 2.00
trans-1,3-Dichloropropene	ND< 2.00
Methylene chloride	ND< 5.00
1,1,2,2-Tetrachloroethane	ND< 2.00
Tetrachloroethene	14.8
1,1,1-Trichloroethane	ND< 2.00
1,1,2-Trichloroethane	ND< 2.00
Trichloroethene	ND< 2.00
Trichlorofluoromethane	ND< 2.00
Vinyl Chloride	ND< 2.00

Aromatics	Results in ug / L
Benzene	ND< 0.700
Chlorobenzene	ND< 2.00
Ethylbenzene	ND< 2.00
Toluene	ND< 2.00
m,p - Xylene	ND< 2.00
o - Xylene	ND< 2.00
Styrene	ND< 2.00
1,2-Dichlorobenzene	ND< 2.00
1,3-Dichlorobenzene	ND< 2.00
1,4-Dichlorobenzene	ND< 2.00

Ketones	Results in ug / L
Acetone	ND< 10.0
2-Butanone	ND< 5.00
2-Hexanone	ND< 5.00
4-Methyl-2-pentanone	ND< 5.00

Miscellaneous	Results in ug / L
Carbon disulfide	ND< 5.00
Vinyl acetate	ND< 5.00

ELAP Number 10958

Method: EPA 8260B

Data File: 65503.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature:


Bruce Hoogesteger: Technical Director

Volatile Analysis Report for Non-potable Water (Additional STARS Compounds)

Client: Day Environmental, Inc.

Client Job Site: RoCity

Lab Project Number: 03-1393

Lab Sample Number: 5103

Client Job Number: 3240S-03

Field Location: MW-1

Date Sampled: 05/27/2003

Field ID Number: 3240-01

Date Received: 05/27/2003

Sample Type: Water

Date Analyzed: 06/02/2003

Aromatics	Results in ug / L	Aromatics	Results in ug / L
n-Butylbenzene	ND< 2.00	1,2,4-Trimethylbenzene	ND< 2.00
sec-Butylbenzene	ND< 2.00	1,3,5-Trimethylbenzene	ND< 2.00
tert-Butylbenzene	ND< 2.00		
n-Propylbenzene	ND< 2.00	Miscellaneous	
Isopropylbenzene	ND< 2.00	Methyl tert-Butyl Ether	ND< 2.00
p-Isopropyltoluene	ND< 2.00		
Naphthalene	ND< 5.00		


ELAP Number 10958

Method: EPA 8260B

Data File: 65503.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature:


Bruce Hoogesteger, Technical Director

Volatile Analysis Report for Non-potable Water

Client: Day Environmental, Inc.

Client Job Site: RoCity

Lab Project Number: 03-1393

Lab Sample Number: 5104

Client Job Number: 3240S-03

Field Location: MW-12

Date Sampled: 05/27/2003

Field ID Number: 3240-02

Date Received: 05/27/2003

Sample Type: Water

Date Analyzed: 06/03/2003

Halocarbons	Results in ug / L
Bromodichloromethane	ND< 2.00
Bromomethane	ND< 2.00
Bromoform	ND< 2.00
Carbon tetrachloride	ND< 2.00
Chloroethane	ND< 2.00
Chloromethane	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00
Chloroform	ND< 2.00
Dibromochloromethane	ND< 2.00
1,1-Dichloroethane	ND< 2.00
1,2-Dichloroethane	ND< 2.00
1,1-Dichloroethene	ND< 2.00
cis-1,2-Dichloroethene	2.30
trans-1,2-Dichloroethene	ND< 2.00
1,2-Dichloropropane	ND< 2.00
cis-1,3-Dichloropropene	ND< 2.00
trans-1,3-Dichloropropene	ND< 2.00
Methylene chloride	ND< 5.00
1,1,2,2-Tetrachloroethane	ND< 2.00
Tetrachloroethene	ND< 2.00
1,1,1-Trichloroethane	ND< 2.00
1,1,2-Trichloroethane	ND< 2.00
Trichloroethene	ND< 2.00
Trichlorofluoromethane	ND< 2.00
Vinyl Chloride	ND< 2.00

Aromatics	Results in ug / L
Benzene	8.24
Chlorobenzene	ND< 2.00
Ethylbenzene	7.04
Toluene	ND< 2.00
m,p - Xylene	2.86
o - Xylene	2.51
Styrene	ND< 2.00
1,2-Dichlorobenzene	ND< 2.00
1,3-Dichlorobenzene	ND< 2.00
1,4-Dichlorobenzene	ND< 2.00

Ketones	Results in ug / L
Acetone	ND< 10.0
2-Butanone	ND< 5.00
2-Hexanone	ND< 5.00
4-Methyl-2-pentanone	ND< 5.00

Miscellaneous	Results in ug / L
Carbon disulfide	ND< 5.00
Vinyl acetate	ND< 5.00

ELAP Number 10958

Method: EPA 8260B

Data File: 65531.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature: _____

Bruce Hoogesteger, Technical Director

Volatile Analysis Report for Non-potable Water (Additional STARS Compounds)

Client: Day Environmental, Inc.

Client Job Site: RoCity

Lab Project Number: 03-1393

Lab Sample Number: 5104

Client Job Number: 3240S-03

Field Location: MW-12

Date Sampled: 05/27/2003

Field ID Number: 3240-02

Date Received: 05/27/2003

Sample Type: Water

Date Analyzed: 06/03/2003

Aromatics	Results in ug / L	Aromatics	Results in ug / L
n-Butylbenzene	ND< 2.00	1,2,4-Trimethylbenzene	42.7
sec-Butylbenzene	17.3	1,3,5-Trimethylbenzene	ND< 2.00
tert-Butylbenzene	ND< 2.00		
n-Propylbenzene	17.2	Miscellaneous	
Isopropylbenzene	10.6	Methyl tert-Butyl Ether	ND< 2.00
p-Isopropyltoluene	5.58		
Naphthalene	130		


ELAP Number 10958

Method: EPA 8260B

Data File: 65531.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature:


Bruce Hoogesteger: Technical Director

Volatile Analysis Report for Non-potable Water

Client: Day Environmental, Inc.

Client Job Site: RoCity

Lab Project Number: 03-1393

Lab Sample Number: 5105

Client Job Number: 3240S-03

Field Location: MW-13

Date Sampled: 05/27/2003

Field ID Number: 3240-03

Date Received: 05/27/2003

Sample Type: Water

Date Analyzed: 06/03/2003

Halocarbons	Results in ug / L
Bromodichloromethane	ND< 2.00
Bromomethane	ND< 2.00
Bromoform	ND< 2.00
Carbon tetrachloride	ND< 2.00
Chloroethane	ND< 2.00
Chloromethane	ND< 2.00
2-Chloroethyl vinyl ether	ND< 2.00
Chloroform	ND< 2.00
Dibromochloromethane	ND< 2.00
1,1-Dichloroethane	ND< 2.00
1,2-Dichloroethane	ND< 2.00
1,1-Dichloroethene	ND< 2.00
cis-1,2-Dichloroethene	3.10
trans-1,2-Dichloroethene	ND< 2.00
1,2-Dichloropropane	ND< 2.00
cis-1,3-Dichloropropene	ND< 2.00
trans-1,3-Dichloropropene	ND< 2.00
Methylene chloride	ND< 5.00
1,1,2,2-Tetrachloroethane	ND< 2.00
Tetrachloroethene	ND< 2.00
1,1,1-Trichloroethane	ND< 2.00
1,1,2-Trichloroethane	ND< 2.00
Trichloroethene	ND< 2.00
Trichlorofluoromethane	ND< 2.00
Vinyl Chloride	ND< 2.00

Aromatics	Results in ug / L
Benzene	3.84
Chlorobenzene	ND< 2.00
Ethylbenzene	10.7
Toluene	ND< 2.00
m,p - Xylene	9.43
o - Xylene	5.15
Styrene	ND< 2.00
1,2-Dichlorobenzene	ND< 2.00
1,3-Dichlorobenzene	ND< 2.00
1,4-Dichlorobenzene	ND< 2.00

Ketones	Results in ug / L
Acetone	ND< 10.0
2-Butanone	ND< 5.00
2-Hexanone	ND< 5.00
4-Methyl-2-pentanone	ND< 5.00

Miscellaneous	Results in ug / L
Carbon disulfide	ND< 5.00
Vinyl acetate	ND< 5.00


ELAP Number 10958

Method: EPA 8260B

Data File: 65528.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature:


Bruce Hoogesteger: Technical Director

Volatile Analysis Report for Non-potable Water (Additional STARS Compounds)

Client: Day Environmental, Inc.

Client Job Site:	RoCity	Lab Project Number:	03-1393
Client Job Number:	3240S-03	Lab Sample Number:	5105
Field Location:	MW-13	Date Sampled:	05/27/2003
Field ID Number:	3240-03	Date Received:	05/27/2003
Sample Type:	Water	Date Analyzed:	06/03/2003

Aromatics	Results in ug / L	Aromatics	Results in ug / L
n-Butylbenzene	14.0	1,2,4-Trimethylbenzene	266
sec-Butylbenzene	28.3	1,3,5-Trimethylbenzene	ND< 2.00
tert-Butylbenzene	ND< 2.00		
n-Propylbenzene	99.0	Miscellaneous	
Isopropylbenzene	58.6	Methyl tert-Butyl Ether	ND< 2.00
p-Isopropyltoluene	3.91		
Naphthalene	ND< 5.00		

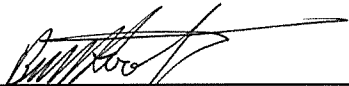
ELAP Number 10958

Method: EPA 8260B

Data File: 65528.D

Comments: ND denotes Non Detect
ug / L = microgram per Liter

Signature:


Bruce Hoogesteger, Technical Director

pH Analysis Report

Client: Day Environmental, Inc.

Client Job Site: RoCity

Lab Project Number: 03-1393

Client Job Number: 3240S-03

Date Sampled: 05/27/2003

Date Received: 05/27/2003

Sample Type: Water

Date Analyzed: 05/27/2003

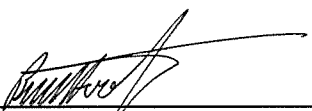
Lab Sample Number	Field Number	Field Location	Result (pH)
5103	3240-01	MW-1	7.09
5104	3240-02	MW-12	6.72
5105	3240-03	MW-13	6.98

ELAP Number 10958

Method: EPA 9040

Comments:

Signature:


Bruce Hoogesteger: Technical Director

PARADIGM ENVIRONMENTAL SERVICES, INC.

179 Lake Avenue
Rochester, NY 14608
(585) 647-2530 * (800) 724-1997
FAX: (585) 647-3311

CHAIN OF CUSTODY

REPORT TO:		INVOICE TO:	
COMPANY:	Pay Environmental Inc	COMPANY:	SAME
ADDRESS:	40 Commercial St	ADDRESS:	
CITY:	Rochester	CITY:	
STATE:	NY	STATE:	
ZIP:	14611	ZIP:	
PHONE:	454 0210	PHONE:	
FAX:	454 0825	FAX:	
ATTN:	Jeff Danzinger	ATTN:	
COMMENTS:		COMMENTS:	

REQUESTED ANALYSIS

DATE	TIME	COMPOSITE	GRAB	SAMPLE LOCATION/FIELD ID	MATRIX	CONTAINER NUMBERS	REMARKS	PARADIGM LAB SAMPLE NUMBER
15/27/03	1500	X		3240-01/mw-1	water	4	✓ TCH 8260 START ✓ TCH 310-13 ✓ TCH 104	5103
25/27/03	1350	X		3240-02/mw-12	water	4	✓	5104
35/27/03	1430	X		3240-03/mw-13	water	4	✓	5105
4								
5								
6								
7								
8								
9								
10								

LAB USE ONLY

SAMPLE CONDITION: Check box if acceptable or note deviation:	CONTAINER TYPE:	PRESERVATIONS:	HOLDING TIME:	TEMPERATURE:
	4			18°C
Relinquished By: <u>10952</u>				
Sampled By: <u>ELC</u>	Date/Time: <u>5/27/03 1410</u>	Relinquished By:	Date/Time:	Total Cost:
Relinquished By: <u>ELC</u>	Date/Time: <u>5/27/03 1430</u>	Received By:	Date/Time:	
Received By: <u>ELC</u>	Date/Time: <u>5/27/03 1430</u>	Received @ Lab By: <u>ELC</u>	Date/Time: <u>5/27/03 1405</u>	P.I.F.: